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Patent and Trademark Office

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/625,769 07/26/00 IIJIMA

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EXAMINER

SCHECHTER, A

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 11/05/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/625,769

Applicant(s)

IIJIMA, CHIYOAKI

Examiner

Andrew Schechter

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "LCD optimizing haze value of diffuser and distance between diffuser and backlight reflector in order to reduce parallax problem"

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

From the description of the problem of parallax in an LCD [p. 5-6], and from the prior art, it appears that the problem of parallax gets worse as the distance d between the diffuser and the reflector are increased, since that increases the "marked difference in the optical path" of the incident and out-going light. However, Table 1 [p. 24] appears to show that the display quality gets better, rather than worse, as the distance d is increased from 0.2 mm to 0.7 mm, for any given haze value. Why is this?

Is it possible that the labels on top of Table 1 are in error, and should read 0.2 to 0.7 from left to right instead of from right to left? If this were the case, the relationship given in claim 1 would be $H \geq 200d - 40$, which would seem to make more sense. (According to the given inequality, having no diffuser at all, $H=0$, but a sufficiently large distance d would result in a good display - contrary to the idea of parallax being caused by the thickness of layers through which the light travels.)

If the specification (and inequality) are indeed as intended, an explanation of the claimed relation between the distance d and the display quality is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Weber et al.*, U.S. Patent No. 5,686,979 or *Ouderkirk et al.*, U.S. Patent No. 5,828,488 in view of U.S. Patent No. 5,889,570 to *Mitsui et al.* and U.S. Patent No. 5,949,506 to *Jones et al.*

Both *Weber* and *Ouderkirk* disclose the basic structure of the claimed device. In Fig. 9, *Weber* discloses a transflective LCD with first and second polarizers [138,140] around a liquid crystal cell [142], a diffuser [134], a reflective polarizer [144] with matching transmission axes to the second polarizer, a lamp/light guide [132], and a

reflector [not shown, but implied]. In Fig. 2, *Ouderkirk* discloses a reflective LCD with polarizers and liquid crystal cell [18,23,20], reflective polarizer [12], backlight [32,34], and reflector sheet [39], and placing a diffuser between the LCD and the reflector is discussed [col. 32, lines 10-21] Having color filters of red, green, and blue, are conventional and would be obvious to one of ordinary skill, in order to create a color LCD, in either invention. Using these devices in an electronic apparatus is either inherent or obvious as well.

Neither *Weber* nor *Ouderkirk* explicitly disclose the final limitation of claims 1-8, which is satisfying the inequality $H \geq -200d + 140$. However, it would be obvious to one of ordinary skill in the art to fulfill this limitation, as it merely requires an optimization of two result-effective variables whose effects are well-known in the art, specifically the diffusion strength H and the internal distance d .

Jones teaches (in an analogous context) that the diffusion strength should be optimized and describes means to do so: "Light diffusion effect by layer 45 increases as the focusing power of the spherical beads 51 increases and the density of the beads increases. Diffusion strength can be tuned by proper selection of bead focusing power, indices of refraction, and density." [col. 7, lines 14-18].

Mitsui teaches (in an analogous context) that parallax is caused by the thickness of a layer which the light travels through [col. 10, lines 29-34] and optimizes (minimizes) this thickness by placing the scattering film and reflector inside the substrates. By reducing the extra distance traveled by the light, *Mitsui* obtains a device "showing no parallax". [col. 10, line 52]. One of ordinary skill in the art would thus find it obvious to

optimize the layer thickness d in order to minimize parallax (though, as noted above, it is not clear to the Examiner why the present specification teaches increasing this thickness d).

Claims 1-8 are therefore unpatentable.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,259,496 to *Kashima* discloses another LCD showing the basic structure of the one in this invention: polarizer, liquid crystal cell, polarizer, reflection polarizer, light guide with lamp, and reflecting plate. However, the reflection polarizer [18] is not a linear polarizer, but based on cholesterics.

U.S. Patent No. 5,953,089 to *Hiji et al.* also teaches optimizing the diffusion strength of a diffusion layer in a reflective LCD.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (703) 306-5801. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Sikes can be reached on (703) 308-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 746-4711 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

AS

Andrew Schechter
October 29, 2001

[Signature]
TOANTON
PRIMARY EXAMINER